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(71) Applicant(s)

**Motorola Israel Limited**

**(Incorporated in Israel)**

**16 Kremenetski Street, Tel Aviv 67899, Israel**

(72) Inventor(s)

**Yona Newman**

(74) Agent and/or Address for Service

**Marc Morgan**

**Motorola Limited, European Intellectual Property  
Operation, Midpoint, Alencon Link, BASINGSTOKE,  
Hampshire, RG21 7PL, United Kingdom**

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(56) Documents Cited

**US 4938707 A**

(58) Field of Search

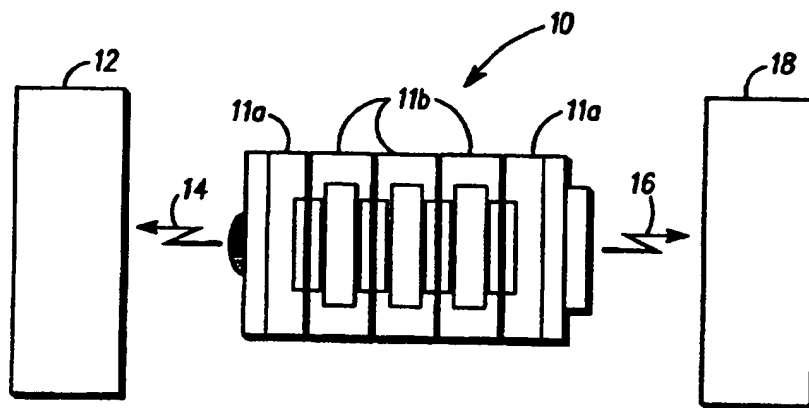
**UK CL (Edition O ) H2E ECHC ECSD ECSF ECSH ECSX**

**INT CL<sup>6</sup> H01R**

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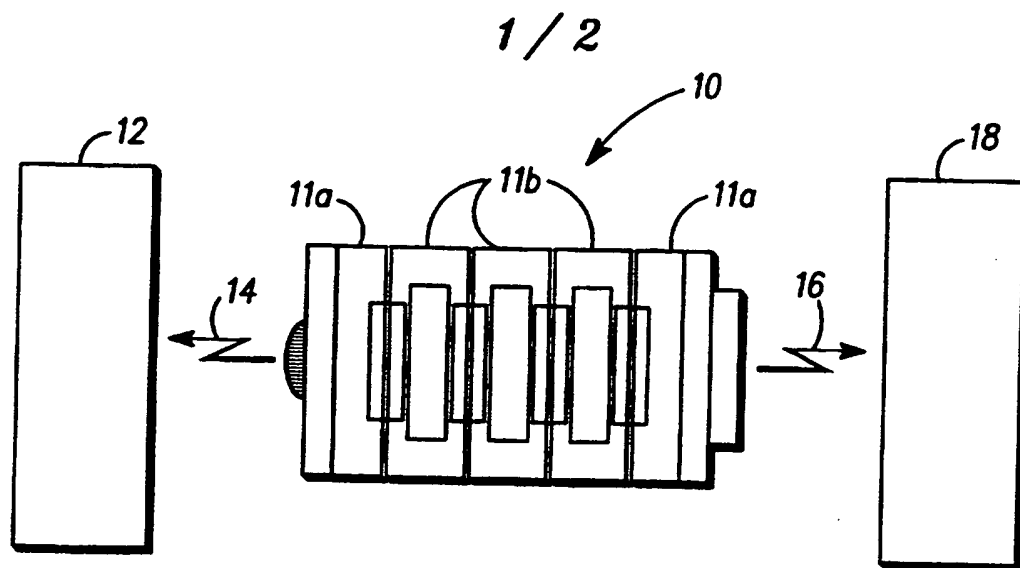
(54) **An adapter**

(57) An adapter (10) for interfacing a first data link (14) to a second data link (16). The adapter (10) includes a set of modules (11) having at least one combination having the ability to interface with the first data link (14) and the second data link (16). The adapter modules may include a translation module for translating the signal from the first data link to the second, a power module for powering the translation module and a noise filter module. The modules may have hermaphroditic connectors with hermaphroditic latch mechanisms.

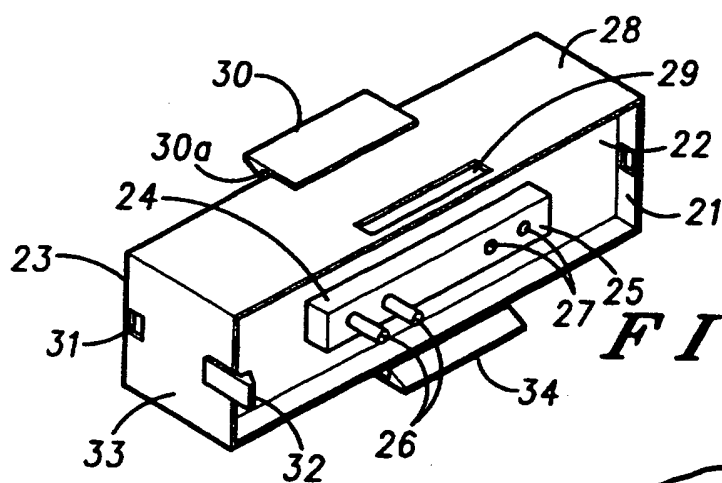


**FIG. 1**

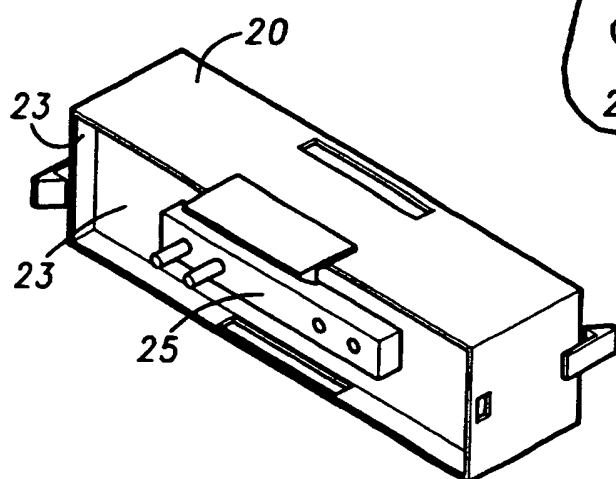
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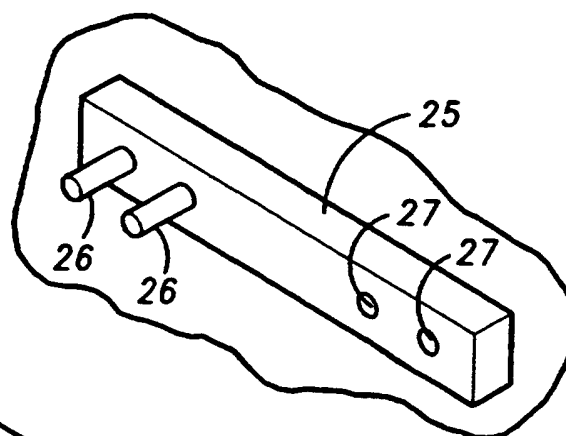
**FIG. 1**



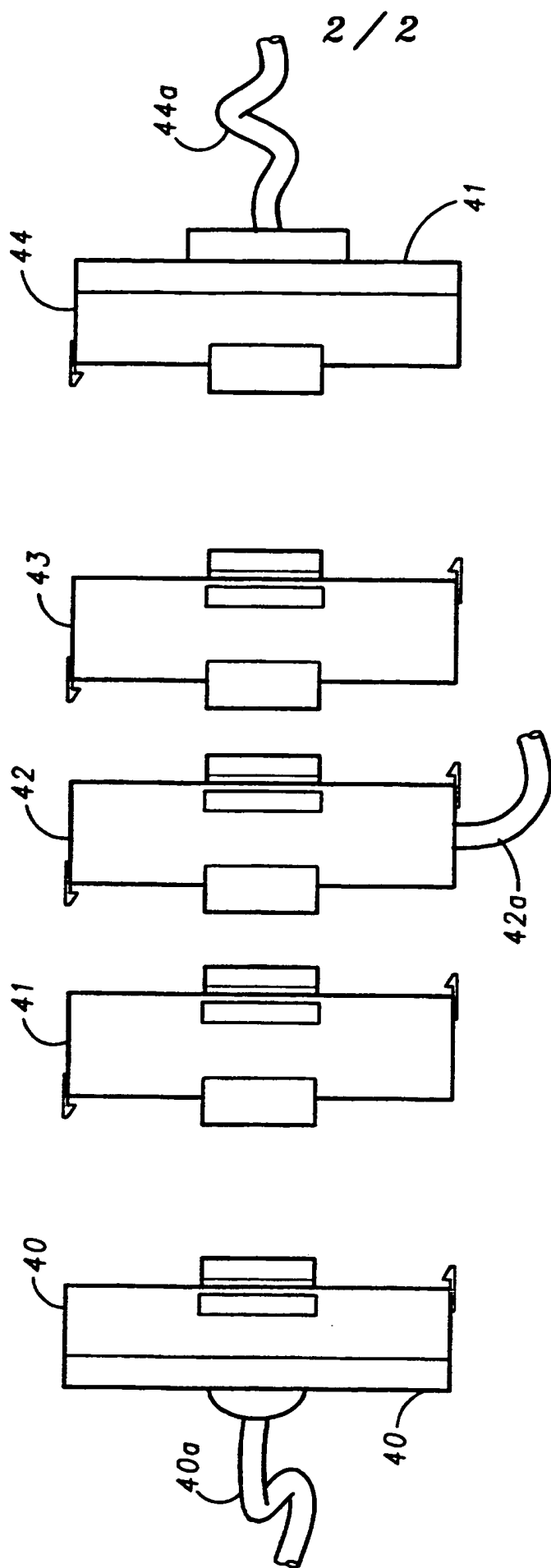
**FIG. 2A**



**FIG. 2B**



**FIG. 2C**



**FIG. 3**

## AN ADAPTER

### Field of the Invention

- 5           This invention relates to an adapter particularly, but not exclusively, to an adapter for interfacing a first data link to a second data link.

### Background of the Invention

- 10           A wide range of equipment may be interconnected to allow data transfer for example, personal computers (PC's), laptops, notebooks, Personal Digital Assistants (PDA's), fax/data modems and so on, use connectors to external circuits such as telephone lines or Local Area Networks (LAN), to allow data transfer to other equipment. The  
15 connectors are of many different types such as DB9, DB15 and DB25 data connectors or RJ-11 telephone connectors. The type of connector used will depend on the equipment to be connected and the form in which the data is to be transferred.

- Because the connectors are of a wide range of types, a mismatch  
20 often occurs and it is necessary to make the connection by means of an adapter. The adapter can be as simple as a cable with suitable connectors on each end or as complicated as an infra-red optical link with optical components, interface electronics, power supply and filtering/protection components. For each different application, a different adapter is used  
25 resulting in a plethora of such devices, each one of which is suitable only for one specific type of data link and circuit configuration.

- This invention seeks to provide an adapter for interfacing between a first type of data link to a second type of data link which mitigates the above mentioned disadvantages.

30

### Summary of the Invention

- According to the invention there is provided an adapter for interfacing a first data link to a second data link comprising a set of  
35 modules which, in use, are assembled into at least one combination having the ability to interface with the first data link and the second data link.

          The advantage of such an adapter is that with the use of a small set of modules, a large range of data link adapters can be built. The adapters

can be sold as assembled units for specific functions or as a kit of modules for a wide range of functions.

Preferably, the at least one combination includes an external connection module for connecting a first communication equipment  
5 having a first data link to the adapter and for connecting a second communication equipment having a second data link to the adapter.

Preferably, the at least one combination includes a translation module for translating an electrical signal from the first communication equipment having a first data link to a electrical signal compatible with a  
10 second communication equipment having a second data link.

The at least one combination preferably, includes a power module for providing voltage to the translation module .

Preferably, the at least one combination includes a filter module for filtering electrical noise signals.

15 In a preferred embodiment, the set of modules include at least one hermaphroditic element connector and at least one hermaphroditic latch mechanism for connecting at least one basic module to another basic module. By hermaphroditic it is meant there are both male and female members so that any one element can mate with another element.

20 A preferred embodiment of the invention will now be described, by way of example only, with reference to the drawings.

### Brief Description of the Drawings

25 FIG. 1 is a side view of an adapter formed from a number of modules for interfacing between a first type of data link to a second type of data link according to the preferred embodiment of the invention;

FIG. 2 is set of isometric views of a internal module used in the adapter shown in FIG. 1; and

30 FIG. 3 is a side view of a combination of five basic modules prior to assembly to form the adapter.

### Detailed Description of the Drawings

35 As is shown in FIG. 1, an adapter 10 formed from a set of modules 11 is used for interfacing between a first data link 14 path connected to a first communication equipment 12, to a second data link 16 path connected to second communication equipment 18. The first data link 14 is an Infra

Red (IR) link on an optical fibre and the second data link 16 is a Recommended Standard (RS) RS232 link on a wire.

There are two types of modules; end modules 11a and internal modules 11b. The internal modules type 11b will be described with  
5 reference to FIG.2.

With particular reference to FIG. 2(a) and FIG. 2(b), the internal module type comprises a generally rectangular body 20 having a peripheral lip 21 projecting from two major faces 22 and 23. Each face 22, 23 has a centrally located projection 24 and 25 of rectangular shape. The  
10 longest dimension of the projections is aligned with the longest dimension of the faces 22 and 23.

An enlarged view of projection 25 is shown in FIG. 2(c). It can be seen that at one end of the projection is located a pair of electrically conductive pins 26. At the other end is located a pair of sockets 27.

15 The projections 24, 25 are arranged to be complementary. That is to say, the pins are aligned with the sockets. This means that the pins on a projection on a first module will engage with the sockets on the projection of a second module. As shown in FIG. 2(a) an upper face 28 includes a recess 29 and a snap 30 which is a resiliently deformable projection of the  
20 lip 21 and is formed with a downwardly directed lug 30a. The lug 30a, is so dimensioned as to fit within the recess 29 on an adjacent module. When a module is assembled, the lug 30a will ramp up over a lip and "snap" into the recess of the adjacent module. A similar recess 31 and snap 32 arrangement is provided on a minor face 3B and also on the lower face (lug  
25 34 being visible on the figure).

The end modules 11a are more clearly shown in FIG. 3 and it can be seen that they are very similar to the inner modules differing in that they have only two respective lugs respectively. Their external faces 40 and 41, are not provided with any lugs or recesses but are provided with whatever  
30 connector or lead is required to connect to the equipment 12 and 18.

FIG. 3 shows the adapter 10 prior to assembly of the modules. The set of modules 11 includes from left to right of the figure, a first external connection module 40, a translation module 41, a power module 42 and a filter module 43 and a second external connection module 44.

35 The external connection modules are chosen from a selection available to a user each one of which will enable connection to a particular type of equipment. A typical set of external connection modules would consist of DB9, DB15, DB25 and RJ-11 mechanical connectors for wired applications, a fibre-optic connector fitting and transceiver

(transmitter/receiver pair) for optical fibre applications, an infra-red transceiver for optical wireless applications and a spread-spectrum transmitter and receiver with antenna for RF wireless applications. For this adapter, the first external connection module 40 includes a IR  
5 transceiver, and optical fibre cable 40a and the second external connection module 44 is a RS232 connector with a wire cable 44a.

The second module is the translation module 41. The translation module 41 includes a circuit which translates between the two protocols used on the data links 14 and 16, in this case RS-232 levels to TTL levels and  
10 vice-versa.

The third module is the power module 42. The power module 42 provides the necessary power for the translation module 41 and the external connection modules 40 and 44, because in this case the power is not available from the external equipment 12 or 18.

15 The fourth module is the filter module 43. The filter module 43 provides filtering against external or internal electrical noise sources and protection against excessive voltage levels from the external equipment. Again this is chosen from a set which will include a general purpose filter and protection module with series inductors, parallel capacitors and  
20 parallel over-voltage protectors, and more specialised modules which will be designed specifically to meet regulatory requirements such as those appertaining to connection to public telephone lines in a particular country. In this case the chosen filter module 43 filters the electrical noise signals generated by the translation module 41, the power module 42 and  
25 the second data link 16.

With the modules 11 selected the user will assemble the adapter 10 by pushing each module in turn onto the adjacent module. This results in each module being electrically connected to the next by means of the pins 26 and holes 27 and disconnection being prevented by the inter-engagement  
30 of the projections and recesses.

The adapter works in the following way. The first external connection module 40, transmits and receives IR signals from the first data link 14. The electrical signals from the IR transceiver in the module 40, pass to the translation module 41. The translation module 41 is  
35 powered by power received from power module 42 and translates electrical signals originating from the first communication equipment 12 to electrical signals compatible with the second communication equipment 18.

The filter module 43 filters electrical noise . Typically this noise is generated by the translation module 41, the power module 42 and the second data link 16. The filtered electrical signals from the filter module 43 pass to the second external connection module 44, from whence they are  
5 transmitted to the second data link 16.

In alternative embodiments of the invention the external connector modules can be of the same type that is both could use RS232 communication techniques. Whilst in the described embodiment the power module was connected to an external power supply it may in  
10 alternative embodiments be battery powered by a battery located within the module or externally.

The number of modules used in any embodiment of the invention and the connection sequence of these modules can be varied to suit the particular adapter function.



Claims

1. An adapter for interfacing a first data link to a second data link,  
comprising:  
5 a set of modules which, in use, are assembled into at least one  
combination having the ability to interface with the first data link and the  
second data link.
2. The adapter according to claim 1, wherein at least one combination  
10 includes external connection modules for connecting a first  
communication equipment having a first data link to the adapter and for  
connecting a second communication equipment having a second data link  
to the adapter.
- 15 3. The adapter according to claim 1 or claim 2, wherein at least one  
combination includes a translation module for translating signals from  
the first communication equipment having the first data link to signals  
compatible with the second communication equipment having the second  
data link.  
20
4. The adapter according to claim 1, claim 2 or claim 3, wherein at  
least one combination includes a power module for providing power to the  
translation module .
- 25 5. The adapter according to claim 1, claim 2, claim 3 or claim 4,  
wherein at least one combination includes a power module for providing  
power to the external connection module .
6. The adapter according to any one of the preceding claims, wherein  
30 at least one combination includes a filter module for filtering out noise  
signals.
7. The adapter according to any one of the preceding claims wherein  
the set of modules comprise:  
35 at least one module having  
at least one hermaphroditic module connector; and  
at least one hermaphroditic latch mechanism for connecting at least  
one module to another module.

8. An adapter substantially as described herein with reference to and or as illustrated by FIG. 1 or FIG. 2 or FIG. 3.

9. A module for use in an adapter as claimed in any preceding claim.

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10. A module substantially as described herein with reference to and or as illustrated by FIG. 2.



**Application No:** GB 9610099.5  
**Claims searched:** 1-10

**Examiner:** E. QUIRK  
**Date of search:** 25 June 1996

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.0): H2E (ECSX, ECHC, ECSF, ECSD, ECSH)

Int Cl (Ed.6): H01R

Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	US 5 340 333 (Interconnect Systems)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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